

**REMARKS**

Favorable reconsideration of this application, in view of the present amendment and in light of the following discussion, is respectfully requested.

Claims 33-34, 37-44 and 47-57 are pending, with claims 55-57 added, and claims 36 and 46 cancelled without prejudice or disclaimer by the present application. Claims 33, 42 and 51 are independent.

In the Official Action, claim 53 was objected to; and claims 33-34, 36-44 and 46-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Emerson (U.S. Patent Pub. No. 2003/0006418), McIntosh (U.S. Patent No. 5,684,309) and Biwa (U.S. Patent Pub. No. 2002/0175341).

In Applicant's amendment of February 25, 2010 claim 53 was amended in response to the current objection. Claims 33 and 42 was amended to recite features related to those in now-cancelled claims 36 and 46. Claim 51 was similarly amended. Claims 33, 37-40, 42, 47-51 and 53 were further amended, and claims 51-54 were added, to more clearly describe and distinctly claim Applicant's invention. Support for this amendment is found in Applicant's originally filed specification. No new matter was added.

Applicant acknowledges with appreciation the interview between the Examiner, the Examiner's supervisor and Applicant's representative on March 18, 2010. The Examiners agreed that the amendment of February 25, 2010 distinguished the claims over the applied references. The Examiners also appeared to agree that the claimed "number of the plurality of pits is 50 or less per area of 5µm×5µm" was not inherent in the applied art. The Examiners recommended that the Applicant file a supplemental response to a) clarify that the claimed

number of the plurality of pits is a non-zero number; and b) provide evidence for why the claimed number of the plurality of pits is not a mere design choice.

In the current amendment, as suggested by the Examiner, claims 33, 42 and 51 are amended to clarify that the claimed number of the plurality of pits is a non-zero number. Applicant files herewith an affidavit regarding the question of design choice.

The following comments are repeated from Applicant's amendment of February 25,

In view of the addition of previously pending claim 36 into claim 33, the rejection of claim 33 is moot. The following comments are directed to the rejection of previously-pending claim 36.

Briefly recapitulating, claim 33 is directed to:

A light emitting diode (LED) comprising:

a first gallium nitride layer;

a super lattice structure including InGaN on the first gallium nitride layer;

an active layer on the super lattice structure including InGaN; and

a second gallium nitride layer on the active layer,

wherein the super lattice structure including InGaN has a plurality of pits formed thereon, and

***wherein a non-zero number of the plurality of pits is 50 or less per area of 5μm×5μm.***

Independent claims 42 and 51 also recite "a non-zero number of the plurality of pits is 50 or less per area of 5μm×5μm."

Emerson describes a Group III nitride based light emitting diode. The diode includes: a Group III nitride based superlattice 16; and a Group III nitride based active region on the superlattice comprising at least one quantum well structure. The at least one quantum well structure includes: a first Group III nitride based barrier layer; a Group III nitride based quantum

well layer on the first barrier layer; and a second Group III nitride based barrier layer on the Group III nitride based quantum well layer.

McIntosh describes a quantum well light emitting diode. However, McIntosh does not cure the deficiencies of Emerson.

Biwa describes a nitride semiconductor device that includes: a first nitride semiconductor layer; an active layer formed on the first nitride semiconductor layer; and a second nitride semiconductor layer formed on the active layer which has a conductivity type opposite to the first nitride semiconductor layer. The second nitride semiconductor layer is formed at a specific growth temperature and having a definable thickness effective to form a surface without pitting.

However, as acknowledged in the rejection of previously-pending claim 36, none of the applied references disclose or suggest a super lattice structure including InGaN has a plurality of pits formed thereon, where a non-zero number of the plurality of pits is 50 or less per area of  $5\mu\text{m} \times 5\mu\text{m}$ . The Official Action argues that the claimed property is presumed to be present (i.e., inherent). Applicant's traverse.

“The fact that a certain result may occur or be present in the prior art is not sufficient to establish inherency of that result or characteristic.”<sup>1</sup> “To establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’”<sup>2</sup>

Indeed, contrary to the Official Action, Applicant's claimed device is manufactured in a process that is different from the process of Emerson in terms of growth temperature, quantity of

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<sup>1</sup> *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1995, 1957 (Fed. Cir. 1993).

<sup>2</sup> *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

Indium, and material of each layer of the light emitting diode. Thus, the process of Emerson cannot ‘inherently’ produce a super lattice structure including InGaN having a plurality of pits formed thereon, where a non-zero number of the plurality of pits is 50 or less per area of  $5\mu\text{m}\times 5\mu\text{m}$ .

Applicant’s claimed feature also is not a mere design choice. In Applicant’s claimed invention, the pits are formed for protecting the light emitting device from electrostatic discharge to thereby improve the operational reliability. If the number of the pits is larger than 50 per area of  $5\mu\text{m}\times 5\mu\text{m}$ , the pits adversely affect the operation characteristics of a light emitting device, e.g., raises the threshold value or lowers the reliability thereof. Applicant files herewith an inventor’s Declaration under 37 C.F.R. § 1.132 regarding the benefits of Applicant’s claimed density of pits.

In view of the preceding comments, Applicant submits that the invention(s) recited in claims 33, 42 and 51 patentably define over the applied references.

Also, because Biwa is directed to avoiding pitting, Biwa teaches away from Applicant’s claimed invention. Thus, for an independent reason, the applied references do not render obvious Applicant’s amended independent claims.

As none of the cited art, individually or in combination, disclose or suggest at least the above-noted features of independent claims 33, 42 and 51, Applicant submits the inventions defined by claims 33, 42 and 51, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.

MPEP 2141 notes that prior art is not limited just to the references being applied, but includes the understanding of one of ordinary skill in the art. MPEP 2141 further notes that the prior art reference (or references when combined) need not teach or suggest all the claim

limitations. However, an obviousness-type rejection must explain why the difference(s) between the prior art and the claimed invention would have been obvious to one of ordinary skill in the art. MPEP 2141 goes on to list exemplary rationales that may support a conclusion of obviousness. However, Applicant submits that the Official Action and the applied references present no objective evidence that would support an obviousness-type rejection of Applicant's amended claims based on one of these exemplary rationales.

### **CONCLUSION**

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Michael E. Monaco, Reg. No. 52,041, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§ 1.16 or 1.147; particularly, extension of time fees.

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Respectfully submitted,

By James T. Eller, Jr.

James T. Eller, Jr.  
Registration No.: 39538  
BIRCH, STEWART, KOLASCH & BIRCH, LLP  
8110 Gatehouse Road, Suite 100 East  
P.O. Box 747  
Falls Church, VA 22040-0747  
703-205-8000

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